

CHOICES

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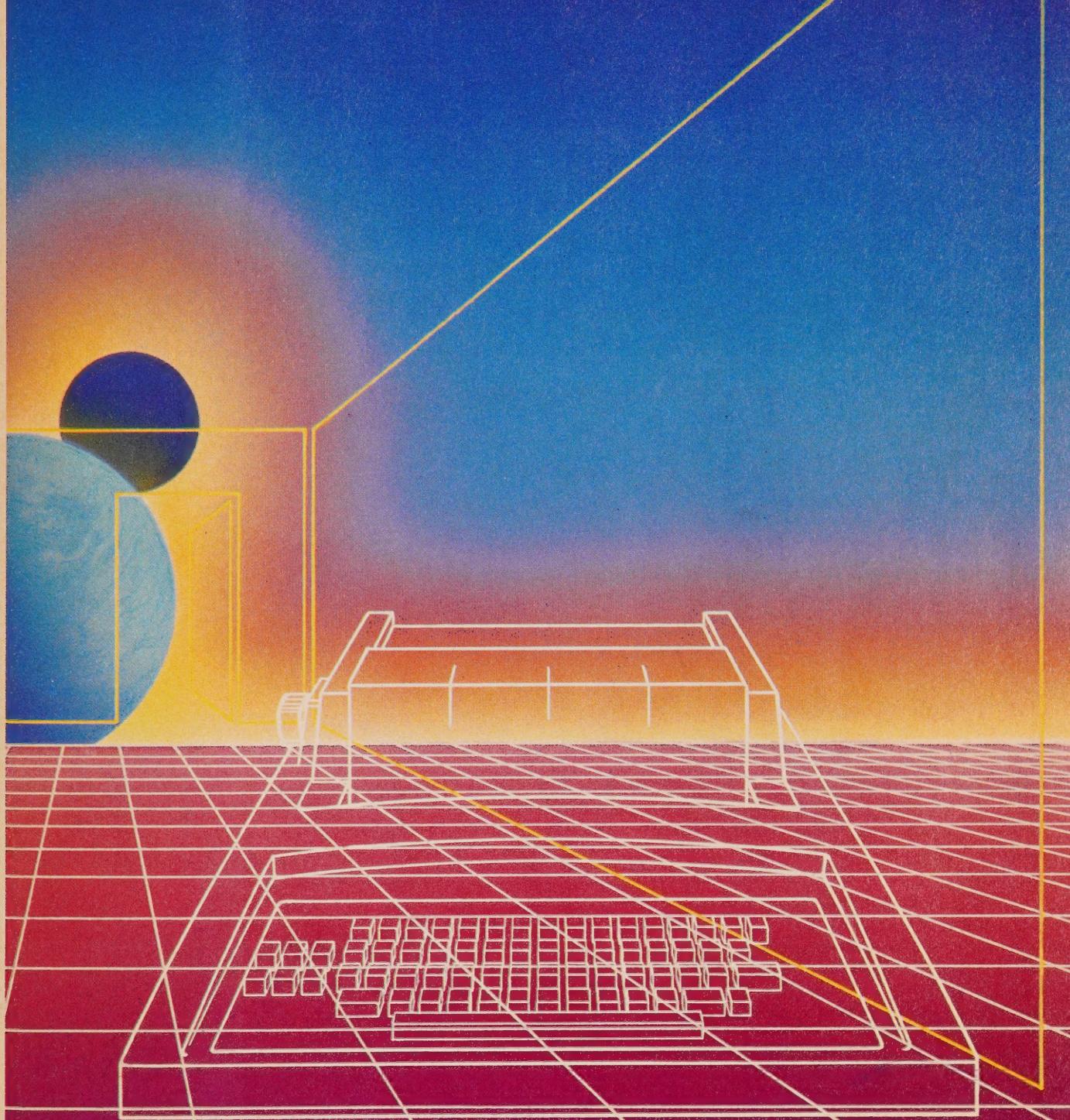
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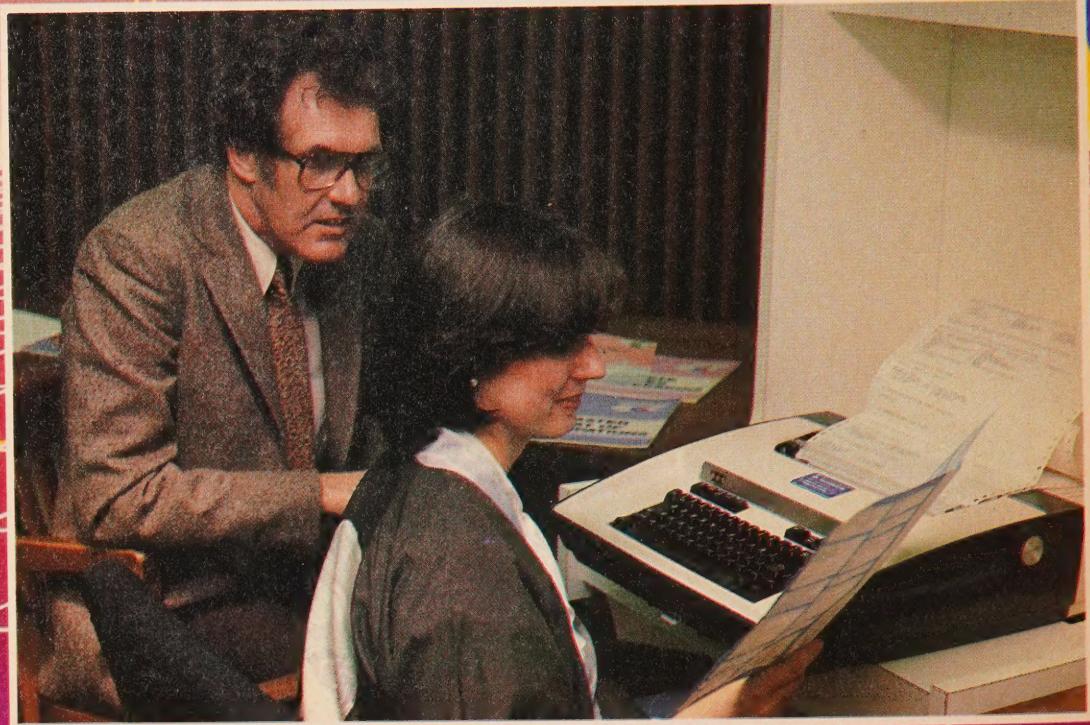
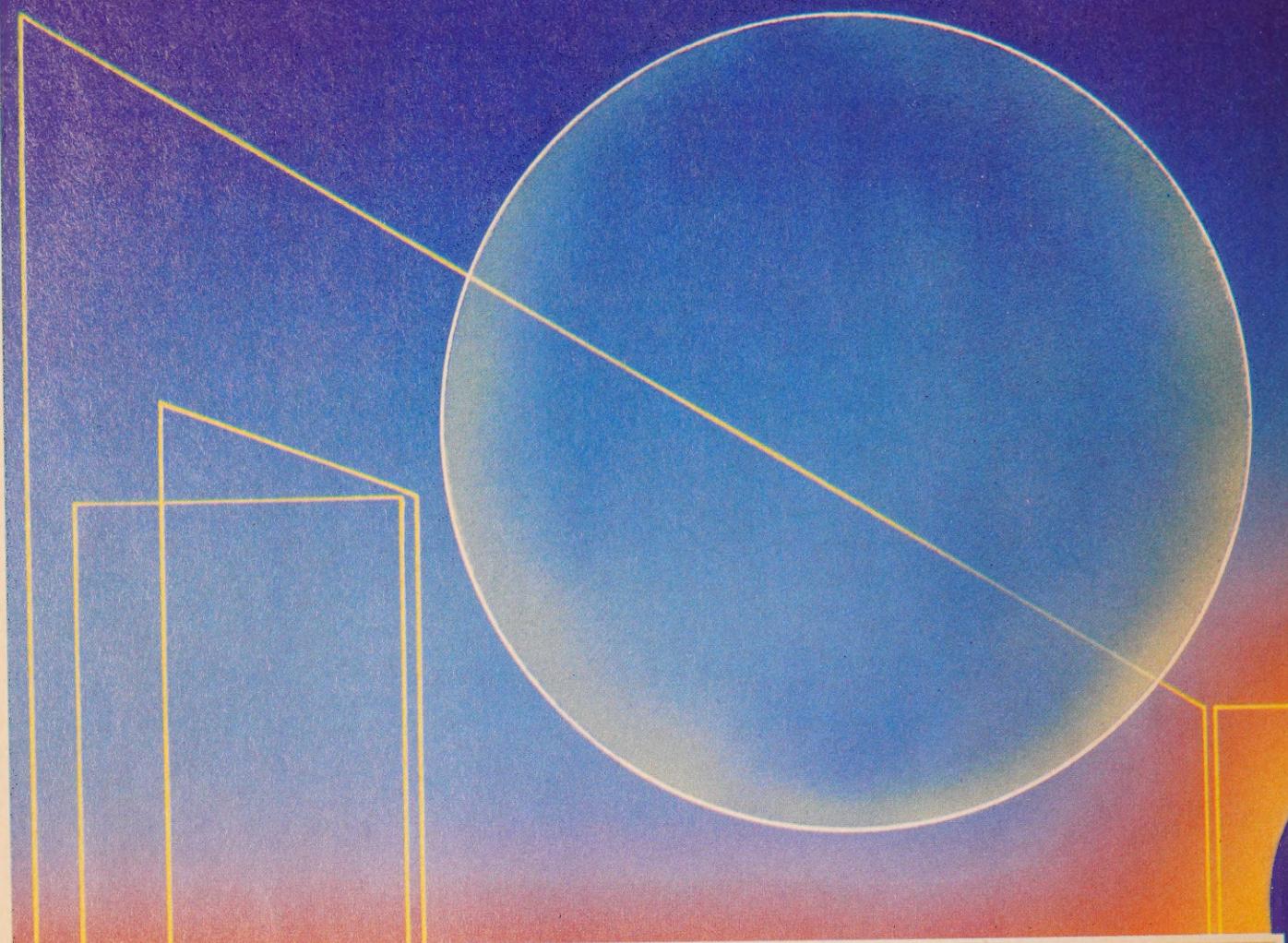


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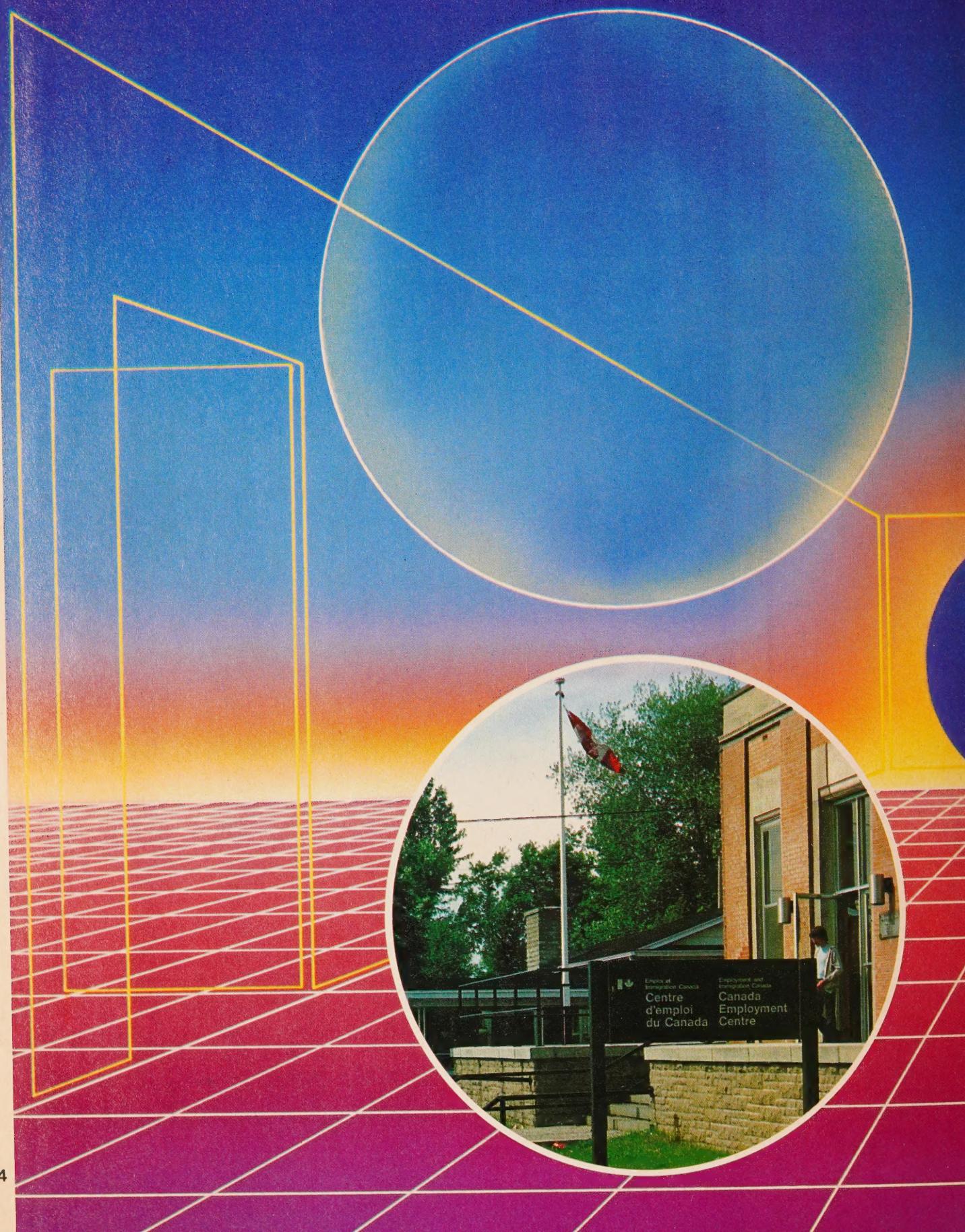
Occupational
and Career Analysis
and Development

Analyse et
développement
Professions et carrières



INTRODUCTION

To make an informed career decision today, a person faces a mountain of up-to-date occupational and labour market information. One individual cannot master this information in its entirety as there is hardly time to adequately research just one career option. When a counsellor and client join forces in this effort, the volume of information becomes more manageable. For some time the Occupational and Career Analysis and Development Branch of the Canada Employment and Immigration Commission has been charged with the production of aids for counsellors and clients that also will help in this task. The most well-known and widely used of these aids, CHOICES, adds a computer to the team of counsellor and client. A person now has the opportunity to "talk" directly to a computer through an interactive terminal keyboard that looks much like a typewriter. The computer is programmed to "talk" back in a simple dialogue format. This conversation appears on a printout which the client can keep when the session is over. Client, counsellor and computer make an effective problem-solving team.



BACKGROUND

Work began on the development of CHOICES early in 1976 after the Branch had carefully examined existing North American systems to determine if any could meet the needs of Canadian employment counsellors and their clients. None met these requirements, and development of a different system began.

By the fall of 1977, CHOICES was ready for field testing. For demonstration purposes, terminals, communicating with a government computer in Ottawa, were placed in a number of Employment Centres and several high schools and career centres in British Columbia and Alberta. From March to June 1978 the field test and demonstration continued in Canada Employment Centres and high schools in Ontario and New Brunswick. A number of refinements were added to the system as a direct result of the field trials and the efficacy of CHOICES as a counselling tool was demonstrated.

In late 1978, the Treasury Board authorized a national cost-effectiveness study with a fifty-terminal network. Early in 1979 over one hundred counsellors and co-ordinators were given a week's training on CHOICES. By April 1, 1979, the fifty terminals were in place, connected with a computer in Toronto, and counsellors were allowed the summer to familiarize themselves with the system. Data collection began in September and continued until March 1980, with post-interaction follow-up interviews forming an integral part of the study after that period. At the same time, further demonstrations were made in schools, two career resource centres in Nova Scotia and Manitoba, and at the Canadian National Institute for the Blind in Toronto. The Department of National Defence was also testing the use of CHOICES in several centres.

During these years of development and testing, interest in CHOICES was high. In Canada, the provinces of British Columbia, New Brunswick, Saskatchewan and Manitoba were given the tapes and documentation necessary to put CHOICES on their own computers. Ontario used the system in a number of community colleges and Nova Scotia purchased the service for some of its high schools. CHOICES had also been running in selected schools, colleges, Employment Security Offices and Rehabilitation Centres in the states of Florida and North Carolina. The system was also provided to Austria.

Because of the growing demands for CHOICES by employment, educational and training agencies in Canada and the United States, Canadian Patents and Development Limited, an agency of the federal Department of Industry, Trade and Commerce, was asked to license a Canadian firm to market CHOICES and to provide technical support for the system. Early in 1980 the Canada Systems Group was chosen, and it has since been marketing CHOICES actively in Canada and the U.S.A.



THE CHOICES SYSTEM

CHOICES has been designed as a dual file system to allow users to access information on occupations and educational and training institutions, or both. The Occupations File, containing detailed information on over 1,100 primary occupations and 3,000 secondary or "similar" occupations, is now currently operational. Access to this information is provided via four different routes: EXPLORE, SPECIFIC, COMPARE and RELATED. The first stage of the Education and Training File was ready for trial use early in 1981. When completed, it will contain information on over 500 post-secondary and vocational education and training institutions, offering over 10,000 programmes of study in all parts of Canada. EXPLORE, SPECIFIC and COMPARE are the three routes people will be able to use when working with this file.

Through a bi-directional linkage system users will be able to move easily between the Occupations File and the Education and Training File. With this system one can access related programmes of study for a selected occupation and vice versa. At the same time CHOICES provides users with a process for selecting personally relevant information which will help them not only during their interaction with the computer, but at other times in their career history. This double file makes CHOICES a very comprehensive source of career and vocational information for Canadian users.

In the Occupations File the most frequently used route is EXPLORE. Users construct their own vocational profile as a hypothetical model and match it against occupational possibilities to determine which are most suitable for them. In the Education and Training File EXPLORE, through the use of a KEYWORD vocabulary, will allow the client to identify schools and programmes of study satisfying his or her needs and interests.

Once a user has narrowed his occupational, educational or training choices and has arrived at some realistic options, the other routes are used to expand on required information. SPECIFIC gives detailed information on individual occupations, programmes of study, or institutions. COMPARE allows users to look at two or three of these in parallel columns at one time. With RELATED, users can determine which occupations match their own characteristics, expressed in the personal profile communicated to the computer.

People can search occupations via any of the following topics:

- Interests
- Aptitudes
- Temperaments
- Education Level
- Environmental Conditions

- Future Outlook**
- Earnings**
- Hours of Work/Travel**
- Physical Demands**
- Physical Activities**
- Inside/Outside Considerations**
- Occupational Fields**

For example, a person might say, "I want only occupations that involve dealing with people in working situations, require high verbal aptitude, provide work indoors, involve no risk situations, pay at least \$24,000 per year and require not more than grade twelve education." CHOICES will respond instantly with a count of occupations which meet these criteria. A list of those occupations can be obtained if the count is 25 or fewer. Users can then get further information on any occupation in the list or search the Education and Training File for compatible programmes of study.

In the Education and Training File, users can search for information using these topics:

- Housing Facilities and Costs**
- Student Financial Aid**
- Category of Students Accepted**
- Special Tuition and Fee Policies**
- Student/Teacher Population**
- Library Facilities**
- General Information (Mailing Address, Category of School)**
- Contacts for Further Information**
- Programmes Offered**
- Student Admission/Completion Rates**
- Language of Instruction/Examination**
- Study Arrangements/Schedules**
- Qualifications Awarded and Programme Durations**
- Tuition and Compulsory Fees**
- Standard Admissions Requirements**

For example, a user might say, "I wish to attend a school that offers a diploma in Business Administration, has fewer than 5,000 students, provides instruction in French and would accept my 65% high school average." A list of these schools will be printed.

Once users obtain lists that conform to their needs, they can ask either file "Why not?" should an occupation, school or training programme not appear. They will then be given answers such as "Because you want too much money," and "Your high school average is insufficient."



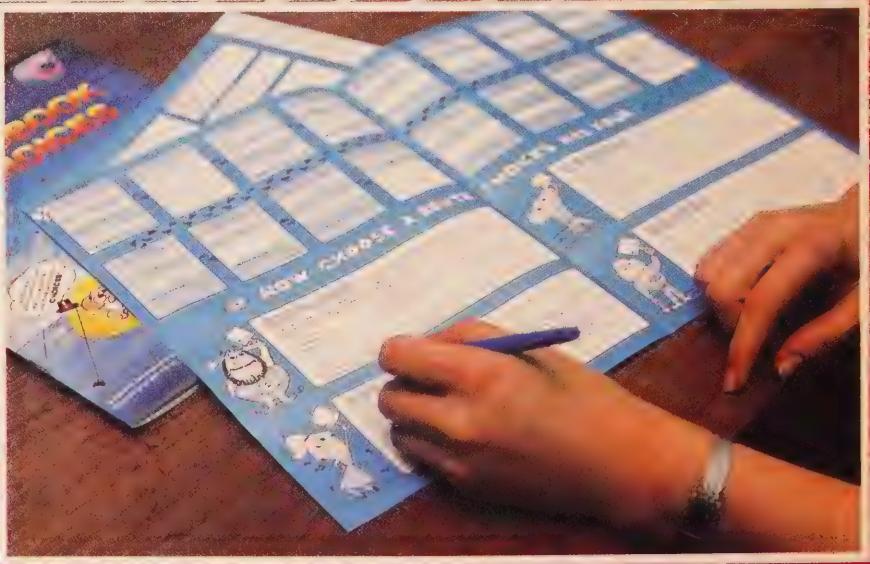


CHOICES can be used in either "converse" or "terse" modes. "Converse" is the long way, with detailed explanation throughout, for the benefit of first-time users. "Tense" is much shorter and implies system knowledge on the part of the user. Repeat users and counsellors can certainly benefit from using the "terse" mode, as a normal session can be telescoped in just three or four minutes.

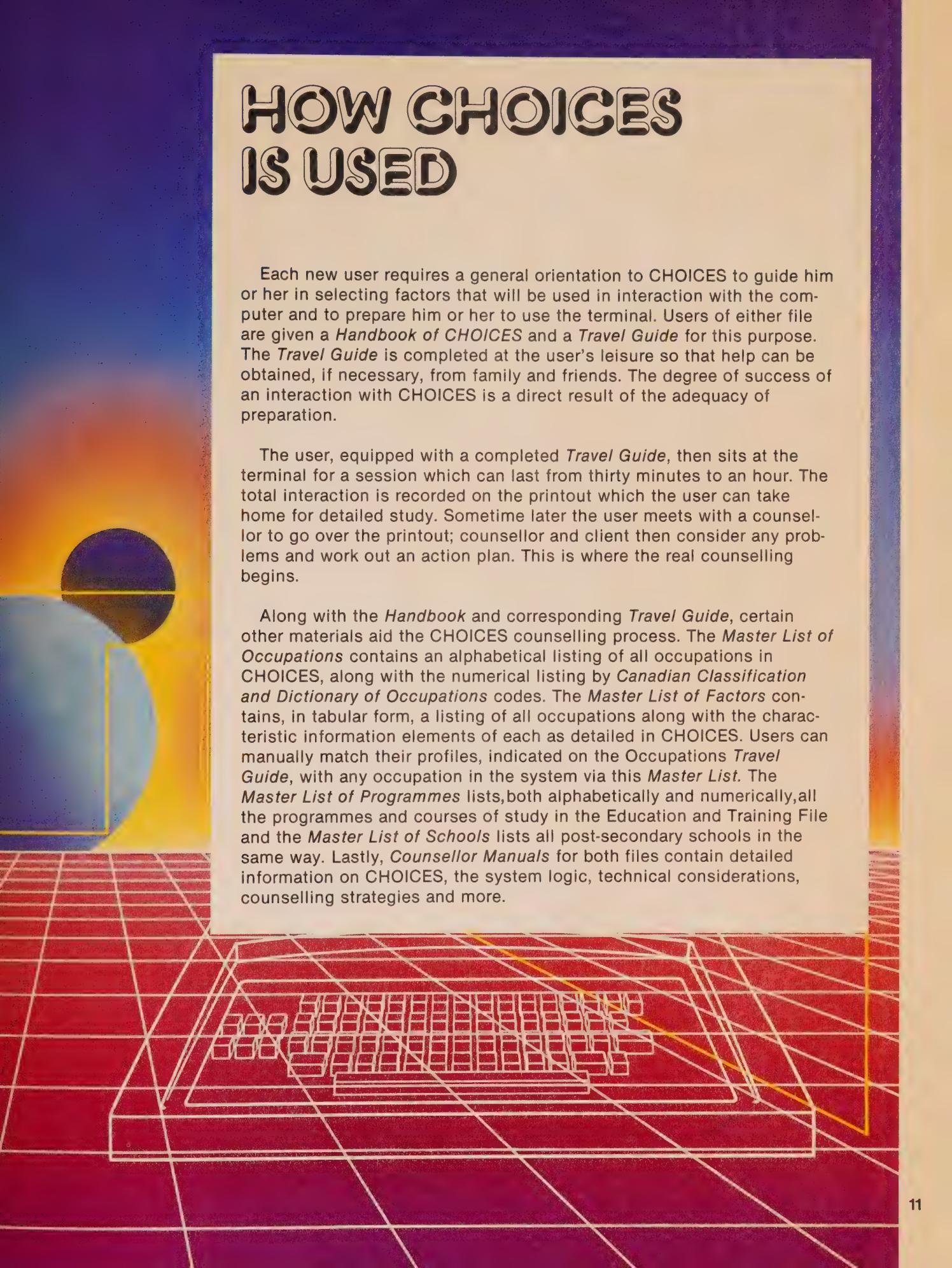
Another feature of CHOICES is the counsellor summary or conversation which appears automatically at the end of an interaction with the computer. It can also be requested at any point during the session. The summary, in a single page, reviews the decisions made by the users and the order in which these were taken. In this way twenty or thirty feet of printout are reduced immediately to a tabular presentation of fifteen to twenty lines.

Also appearing, after each listing of occupations, is a single band or profile representing the combination of characteristics which generated the list. This is especially useful to allow counsellors to see at a glance where clients might have changed answers or deviated from their original self-profile.

Users can easily switch languages, since CHOICES is bilingual in English and French. They can also change from one province to another as some information, such as earnings and educational requirements for certain occupations, vary from province to province. Such easy movement allows the user to make quick comparisons.



HOW CHOICES IS USED



Each new user requires a general orientation to CHOICES to guide him or her in selecting factors that will be used in interaction with the computer and to prepare him or her to use the terminal. Users of either file are given a *Handbook of CHOICES* and a *Travel Guide* for this purpose. The *Travel Guide* is completed at the user's leisure so that help can be obtained, if necessary, from family and friends. The degree of success of an interaction with CHOICES is a direct result of the adequacy of preparation.

The user, equipped with a completed *Travel Guide*, then sits at the terminal for a session which can last from thirty minutes to an hour. The total interaction is recorded on the printout which the user can take home for detailed study. Sometime later the user meets with a counsellor to go over the printout; counsellor and client then consider any problems and work out an action plan. This is where the real counselling begins.

Along with the *Handbook* and corresponding *Travel Guide*, certain other materials aid the CHOICES counselling process. The *Master List of Occupations* contains an alphabetical listing of all occupations in CHOICES, along with the numerical listing by *Canadian Classification and Dictionary of Occupations* codes. The *Master List of Factors* contains, in tabular form, a listing of all occupations along with the characteristic information elements of each as detailed in CHOICES. Users can manually match their profiles, indicated on the *Occupations Travel Guide*, with any occupation in the system via this *Master List*. The *Master List of Programmes* lists, both alphabetically and numerically, all the programmes and courses of study in the Education and Training File and the *Master List of Schools* lists all post-secondary schools in the same way. Lastly, *Counsellor Manuals* for both files contain detailed information on CHOICES, the system logic, technical considerations, counselling strategies and more.



IMPLICATIONS FOR COUNSELLING



The Canada Employment and Immigration Commission provides employment counselling to Canadians. Employment counselling is defined by the Commission as "The process of dynamic interchange between counsellors and clients whereby counsellors assist clients to:

- (1) articulate and clarify the nature of employment problems;
- (2) increase self-understanding in terms of personal resources, interests, aspirations and other;
- (3) relate this knowledge to the world of work;
- (4) identify and assess a number of alternative solutions to employment problems; and
- (5) choose and become committed to courses of action to overcome difficulties and secure enriching and satisfying employment."

CHOICES requires that people, in consultation with CEC counsellors, consider and make decisions regarding their personal resources, interests, aspirations, and values. CHOICES then relates these decisions to the world of work in a manner and at a speed impossible for human counsellors.

In addition, CHOICES presents a considerably fuller range of options than would normally be suggested by a counsellor, without any gaps or distortion resulting from sex, age or other forms of bias. To the computer all users are absolutely equal. CHOICES then goes on quickly to provide information on all of the educational and training options that support the person's occupational goals with a speed and thoroughness beyond the capacity of a human counsellor. The computer never gets tired, bored, wishes it were somewhere else, or needs a coffee break.

In terms of the Commission's operational definition of employment counselling, CHOICES is expected to be a valuable asset in assisting clients with employment problems. However, CHOICES actually does little counselling; it is basically a highly sophisticated information retrieval system. It does exceptionally well those things counsellors have never been able to do adequately — keeping totally up-to-date on all aspects of the full range of occupations, training programmes and schools in this country, and then being able to relate instantly any of this information to personal data about a client. Hence its place on the team is defined.

As a computerized information system, with a large range of data available almost instantly, CHOICES is expected to reduce substantially many of the tedious, repetitive, essentially clerical information-giving functions on which counsellors must currently spend much of their time. This will free them to spend a larger proportion of their time in more advanced counselling functions.

Counsellors working with CHOICES are expected to provide a pre-interaction orientation for users and a post-interaction follow-up session to evaluate the output from the computer and make a plan of action. In post-interaction sessions the counsellor's role is very important because, unfortunately, users are prone to accept unquestioningly the computer's recommendations regarding career options. They tend to feel that suggestions from this sophisticated mechanical brain must be correct. They fail to realize that the response of the computer can never be more realistic or appropriate than the input of the user, even though this is pointed out in the *Handbook of CHOICES*. If a person tells CHOICES the "wrong" Interests and Aptitudes, the system will recommend the "wrong" occupations. Counsellor mediation will help to ensure both the appropriateness of the input and the realistic evaluation of the output. Above all, the counsellor will be able to help the user make the necessary plans and take the necessary actions concerning further education, training or other preparations necessary to enter a recommended occupation. At the very least the counsellor can assist the client in narrowing down a list of possibilities in order to make a final decision.



GENERAL TECHNICAL CONSIDERATIONS

CHOICES was developed originally for a Burroughs computer, but the system has been converted to function on an IBM computer. Service for the national cost-effectiveness study and subsequent use in CECs was provided by a Burroughs computer until March 1981, after which the conversion was completed to the IBM system.

The IBM version of CHOICES is designed to run on any IBM system which supports CICS/VS and DL/1. The system includes the 370 series, the 303X series, and the IBM 3705 or equivalent control unit. Storage of the data files requires forty megabytes of on-line storage. A total of 800 K-bytes of memory accommodate the on-line programme, TP software and buffers. CHOICES uses CICS/VS, the IBM generalized DB/BC control system and IMS/VS (DL/1), the data base management component of IBM's Information Management System (IMS). Teletype 43 terminals using ASC11 code at a 300 baud rate are used to support the 120-character script text line of CHOICES. The programmes are written in COBOL and access two ASSEMBLER sub-routines during execution.

On the Burroughs B6700/B6800 system, CHOICES requires 25 megabytes of on-line storage. Seven hundred and twenty K-bytes of memory accommodate the on-line programme, TP software and buffers. The Burroughs TP monitor used with CHOICES is GEMCOS. Teletype 43 terminals using ASC11 code at a 300 baud rate are used. Any similar terminal which can support the 120-character script text line of CHOICES is suitable. CHOICES programmes are written in COBOL, and they access two ALGOL sub-routines during execution.

Work on system optimization is a constant activity. Any enquiries for the most up-to-date information should be directed to the CHOICES project leader at the Canada Employment and Immigration Commission, Ottawa.

CONCLUSION

Experience with operational computerized career information systems in North America has been positive. Counsellors, for example, feel that this mode of career information delivery enriches the occupational decision-making process by stimulating exploratory activity and by introducing more order into the decision-making and counselling process. They also feel that the level of client participation in the career planning process is raised and that more meaningful client-counsellor communication is facilitated. More and better information is made available in the time usually spent by counsellors on information delivery. With the exception of those who lack basic language skills, disadvantaged clients are able to use and gain the same benefits from the system as non-disadvantaged clients.

The notion of a personal conversation with a computer to obtain career information is highly appealing to clients. Because elements both of mystery and fun are involved, the experience is not only rewarding but also enjoyable. Experience has shown that people do not have any fear of the technology involved. In fact, for a variety of reasons, a significant number of people who would never go to a counsellor will go to a computer terminal.



